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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/572,893	03/20/2006	Fufang Zha	2003P87075WOUS	2949

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SIEMENS CORPORATION  
INTELLECTUAL PROPERTY DEPARTMENT  
170 WOOD AVENUE SOUTH  
ISELIN, NJ 08830

EXAMINER
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MENON, KRISHNAN S

ART UNIT	PAPER NUMBER
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1797

MAIL DATE	DELIVERY MODE
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12/17/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/572,893	<b>Applicant(s)</b> ZHA ET AL.	
	<b>Examiner</b> Krishnan S. Menon	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,4-11,13-18 and 24-28 is/are pending in the application.
- 4a) Of the above claim(s) 13-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4-11 and 24-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

Claims 1, 4-11,13-18 and 24-28 are pending as of 11/12/09, as amended in the RCE of 6/2/09, of which claims 13-18 are withdrawn from consideration.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 4-11 and 24-28 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over the pending process claims of copending Application Numbers as shown below. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant application claims the limitations claimed in these reference applications.

11/179,391: Claims 1-4,6,7,9-11,13-19

11/316,593: Claims 1-18,20-25,30

11/574,819: Claims 1-10

11/912,859: Claims 1-25

10/569,565: Claims 15-40

10/572,971: Claims 1-11.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Regarding the applicant's suggestion that a terminal disclaimer will be filed, please note that the double-patenting rejection cannot be removed until a terminal disclaimer is filed.

### ***Claim Rejections - 35 USC § 103***

1. Claims 1, 4-11 and 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Smith (US 5,403,479), Sunaoka et al (5,209,852), Kopp et al (US 5,643,455), Cote et al (US 2001/0052494).and/or JP 11076769.

**Smith** teaches filtering using submerged membranes in a tank and backwashing the membrane as claimed under low pressure and pulsed flow with, among other options, permeate liquid – see column 11, lines 20-61 and the figures. Pressure applied is below the bubble point (line 30 at column 11). Smith in example (4) (fig. 4) shows permeate as the backwash fluid. Smith also teaches using a gas for the back flush – C12, L19-25, in which case there will be residual permeate in the hollow fiber lumen as

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well as the header and piping when the permeate side is switched (isolated: which requires operation of a valve; such steps are implied when Smith teaches using a gas to back-flush) to admit the gas, which would read on, or at least make obvious, the claims as amended. Smith also teaches that back-flushing using low pressure gas is well known in the art and discusses the pros and cons of this process – see C7, line 66 - C8, L47; particularly C8, L39-47. Lines 39-47 of column 8 teach that hydraulic back flushing by permeate using low pressure gas is well known in the art.

. Smith teaches cleaning hollow fiber membranes by back-pulsing with low pressure fluids in the lumen, wherein the cleaning agent can be a gas – see column 11, L 20 – C 12, L25. Specifically, Smith teaches using “no more than the bubble point”. Smith also teaches bubbling air on the external surface of the membrane (fig 2, C17, L7-31). Isolating the membrane from the filtrate collection area is implied when the reference teaches introducing a gas or cleaning chemical into the lumen.

What Smith does not teach is pressurizing the membrane from both ends. However, Smith does teach that the dead-end backwashing is known (C8, L39-47). Thus, providing the gas pressure from both ends of the membrane would be obvious to one of ordinary skill in the art, and is not a patentable process step. Also the specific details of the lines and manifolds to be included in the backwash is also not patentable – these are only details of implementing the process step in to a specific system, which would be within the skill of one of ordinary skill.

**Sunaoka** teaches in column 1, under “Prior Art” (line 14), scouring the membrane (scrubbing) with gas bubbles, backwash before, during or after scouring, and

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drain down. Sunaoka teaches draining by charging compressed air - see column 6, lines 63-68. Sunaoka teaches in column 8, line 63 - column 9, line 21, blow down of the wastewater from the tank using water head or compressed air, as well as secondary washing after the blow-down. Sunaoka also teaches using compressed air to effect backwash – see column 10, lines 58-64. Also, using compressed air to effect pumping of liquids, and particularly, for backwashing filters and membranes is well known in the art.

**Kopp** teaches using air in the lumen of the hollow fibers at below the bubble point to flush water from the lumen and then above the bubble point to have effective air back-flush, while agitating the membrane. Kopp, C3, L27 – C4, L50. Scouring with external gas – see C4, L10-13. Kopp also contemplates the various steps recited in the dependant claims, such as reducing the volume of the liquid suspension, etc. Kopp also teaches delaying the onset of filtration process until the expanded membrane is relaxed to its normal condition after the back wash with air bubbles through the lumen (to prevent quicker plugging of the expanded fiber pores as they relax), which suggests using Smith's teaching to modify Kopp, so that the backwashing is done only at a pressure as taught by Smith. Agitation of the membrane by scouring gas is taught by Cote, and is well known in the art.

**Cote** teaches back-washing and back-pulsing the membrane while scouring the membrane externally with air bubbles, which is conducted before or during draining the tank – see under the heading: "Chemical Cleaning with Tank Drained or Draining". The chemical cleaning agent can be a gas. Scouring the membrane with gas bubbles to

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keep the surface clean as well as agitate the fluid is also well known in the art, and is not an inventive process step. Cote Fig 1 and corresponding disclosure (paragraph 0025) shows that the backwash is applied through both ends of the hollow fibers.

It would be obvious to one of ordinary skill in the art to use the teachings of Kopp and/or Smith in the teaching of Cote to improve the cleaning process of Cote, particularly, by removing the permeate in the lumen by gas pressure below the bubble point, as suggested by Kopp or Smith.

**JP-11076769** also teaches backwashing wherein the gas pressure is below the bubble point – see JP translation provided herewith, in an 892.

**KSR Int'l. v. Teleflex Inc.**, 127 S. Ct. 1727, 1732, 82 USPQ2d 1385, 1390 (2007): “it is commonsense that familiar items have obvious uses beyond their primary purposes, and a person of ordinary skill often will be able to fit the teachings of multiple patents together like pieces of a puzzle”. “The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results”.

It would be obvious to one of ordinary skill in the art to combine the teachings of these references to arrive at the process recited in the claims because it would be obvious to use known process steps such as using compressed air to effect fluid flow to backwash the membrane, the backwash pressure being sufficient to make the liquid flow as taught by Smith, Sunaoka and/or Kopp in the process of filtering, scouring the membrane and draining as taught by Sunaoka or Cote; results of such steps being only predictable. For example, one would use the teachings of Smith for the backwashing

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steps in the teaching of Sunaoka because it is highly effective according to Smith (column 11, lines 1-3), and one would use the teaching of Sunaoka in the teaching of Smith to drain the tank and get rid of the accumulated waste especially in batch and semi-continuous operations.

Regarding the “inside-out” filtration as in claim 10, it is well known that hollow fibers can be used for both “outside-in” and “inside-out” operation, as is evidenced by **Bartels et al** (US 2003/0150807): paragraph 0039; or Smith C1, L18-23. Therefore, having the process recited for an “inside-out” filtration membrane would be obvious, compared to the “outside-in”.

Additional details of the structure of the membrane system are well known in the art, and the references do teach such details. Suspending filtration and isolating the lumen of the hollow fiber and the header/manifold are implied if not explicit in the references, since providing a gas through the lumen of the hollow fibers for back flush require that the lumen and the manifold is fluidly connected to such gas source. Applying back flush requires stopping the filtration process, which is not inventive as argued.

The additional step of venting the gases remaining in the lumen is also implied, since such gas remaining in the lumen will be vented out through the filtrate flow when normal filtration is resumed. This is also not an inventive process step.

### ***Response to Arguments***



Applicant's arguments filed 11/12/09 have been fully considered but they are not persuasive.

Declaration by Mr. Bruce Biltoft:

Mr. Biltoft's declares that MEMCOR (R) CP ultrafiltration systems are sold by Siemens Water Technologies Corp., and that these systems are commercially successful, and that these systems perform in accordance with the method recited in claim 1. However, the Declarant has failed to link the commercial success of these systems to the claimed invention. Paragraphs 4-9 describe some marginal improvements (5% capital cost reduction, 1% improvement in operating efficiency and 20% reduction in backwash waste). These data do not provide any unexpected result. The Smith reference teaches various methods of quick and efficient backwashes, and such results only predictable from the teaching of the Smith. Subsequent paragraphs describe that 25% of Siemens Water Technologies' membrane market share and 50% of the hollow fiber membrane sales by Siemens uses the method of claim 1; and there is a 500% increase in sales in the past 4 years. However, the declarant provides no evidence that the sales increase is directly the result of the claimed invention. Thus the declaration fails to overcome the prima facie case.

Declaration of Dr. Zha:

Dr. Zha's declaration addresses the references individually by picking recited elements of the claims which are not explicitly stated in the references. He then goes on to state that he would not be motivated to modify the reference. The statements of

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Dr. Zha are only his opinions, and not objective evidence for overcoming the prima facie case of obviousness.

The claimed invention is applying a back-pressure with compressed air at a pressure lower than the bubble point of the membrane, such pressure being applied through both ends of the membranes and associated conduits and manifolds, and the backwash is conducted while scouring the external surface of the membrane with gas bubbles. Scouring the membrane during backwash cycle is well known (Sunaoka, Cote, for example); backwashing with permeate driven using a gas at pressure below the bubble point is also well known (Kopp, Smith, JP reference); and applying backwashing through both ends of the hollow fibers is also known (see Cote). Combination of such well known elements is within the skill and commonsense of one of ordinary skill in the art and is not a patentable invention.

Analysis of obviousness may include recourse to logic, judgment and commonsense available to person of ordinary skill: *Perfect Web Technologies, Inc. v InfoUSA, Inc.* (Fed Cir, 2009-1105, 12/2/2009)

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Krishnan S Menon/  
Primary Examiner, Art Unit 1797